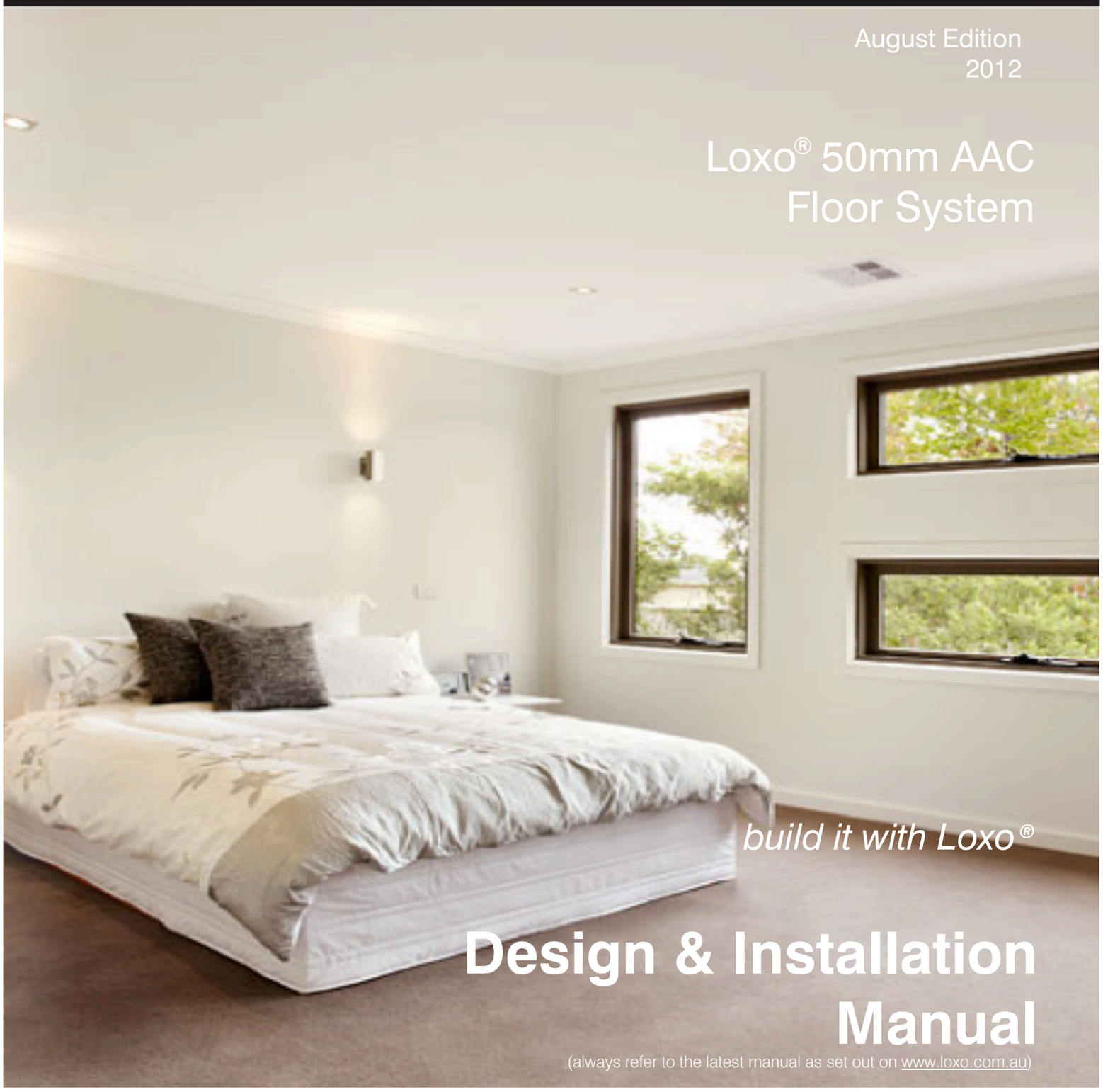
LOXO®
CLADDING SYSTEMS

August Edition
2012

Loxo® 50mm AAC Floor System



build it with Loxo®

Design & Installation Manual

(always refer to the latest manual as set out on www.loxo.com.au)

Australian Certified

Australian Tested

Memberships

Head Office: 1331 Stud Road, ROWVILLE, VIC 3178 | NSW | QLD | SA | WA |
| International Office: New Zealand | Christchurch |

Autoclaved Aerated Concrete (AAC)

What Is AAC? (Light Weight Concrete)

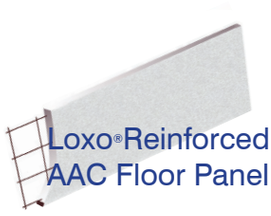
Autoclaved Aerated Concrete (AAC) is manufactured from cement, sand (silica), lime and water, it is aerated by adding an expanding agent to the mix (small amounts of aluminium paste). The mix is poured into a mould (a very large cake tin), to approximately 2/3 of the height of the mould, almost instantly the expanding agent reacts with the other elements, and the mix begins to rise in the mould. (A chemical reaction expands the mixture to form small, finely-dispersed air bubbles).

The moulds are pre-cured in a heated room for several hours. Then the semi -solid material (still in a green state) is transported to the cutting machine. The soft but semi-solid block is sliced into the required panel size using steel wires. Once sliced, the block is steam pressure cured in autoclaves for up to 12 hours. The expanding chemical reaction combined with the Autoclave process is what gives AAC it's unique properties. AAC has excellent thermal insulation and acoustic absorption properties, it has superior fire resistance qualities and is also termite resistant.

Its properties and specifications satisfy all relevant building codes. Working with AAC is easy and efficient. AAC is both versatile and economical. AAC meets the diverse demands better than any other material due to the numerous advantages of its physical and mechanical properties.

The LOXO® CLADDING SYSTEM Design & Installation Manual has been developed to provide design, installation and technical information to 'end users' ranging from the owner builder, licensed builders, building consultants, designers, architects and engineers.

Although the details provided in this Design & Installation Manual have been developed by Loxo® and are intended to represent good building practice, the registered professionals involved in the project (such as the licensed builder, architectural designer and engineering consultant) must ensure that the information provided in this Design & Installation Manual is appropriate and suitable for the project.



Loxo® Reinforced AAC Floor Panel

In Compliance with QMS Certificate ISO 9001

Loxo® & Nasahi in Australia

Nasahi have signed an exclusive agreement within the territory of Australia for Loxo® to be the sole distributor of Nasahi's 50mm AAC Loxo® panel. Nasahi was formed via a joint venture between the world leader in AAC technology (Japan) and the world leader in low cost, efficient manufacturing (China), the result being a high quality, technologically advanced, low cost AAC Building Materials Manufacturer. With a total investment exceeding $45,000,000 USD Nasahi are one of the largest AAC manufactures in the world and are renowned worldwide for their quality manufacturing practices.
Loxo® has adopted Nasahi's high quality 50 mm AAC products and created a simple and robust external cladding system ideally suited for the Australian and New Zealand building markets.

Compliance with Building Code of Australia

The BCA is part of the Australian National Construction Code system and defines minimum standards for buildings. The BCA consists of two volumes:

Volume One - provides requirements for commercial, residential and public building defined as Class 2 to 9 in the BCA. Typical examples include offices, commercial, health buildings, flats and boarding houses.

Volume Two – Housing Provisions, considers domestic construction defined as Class 1 and 10. Typical examples include houses, garages, swimming pools, carports and the like. The BCA is a performance based building code and contains requirements for Structures, Fire Resistance; Damp & Weatherproofing, Sound Transmissions & Insulation and Energy Efficiency.

The Loxo® Panel Systems and Compliance with the BCA

The Loxo® Panel Systems have been assessed to meet and comply with all the necessary performance requirements of the BCA. This Design & Installation Manual contains the information necessary to assist in the design of a project.

The designer should ensure the proposed use of the system satisfies the Performance Requirements and provides sufficient design information (including Loxo® appraisal and installation manuals) to satisfy the requirements of the appropriate authority.

The Loxo® Panel Systems have been appraised by BEAL in New Zealand (Certificate Number C1128) and CodeMark via Global-Mark in Australia (CodeMark Certificate Number 30031Rev A) to meet all the required provisions of the Building Code of Australia for Volume One and Volume Two as listed below.

1. **Volume One BP1.1, BP1.2 and Volume Two P2.1** in respect of structural performance;
2. **Volume One CP1, CP2 and Volume Two P2.3.1** in respect of fire performance;
3. **Volume One FP1.4 and Volume Two P2.2.2** in respect of weatherproofing for external walls;
4. **Volume One FP1.5 and Volume Two P2.2.3** in respect of damp-proofing for external walls
5. **Volume One FP5.2 and Volume Two P2.4.6** in respect of acoustic performance of walls
6. **Volume One GP5.1 and Volume Two P2.3.4 and P3.7.4** in respect buildings constructed in a designated bushfire prone area.
7. **Volume One JP1 and Volume Two P2.6.1** in respect of energy efficiency of walls

The Loxo® Panel Systems have been appraised as an Alternative Solution in terms of compliance with the Building Code of Australia.

The CodeMark Certificate and the BEAL Appraisal are attached in the Appendix of this Design and Installation Manual or visit www.loxo.com.au to download a copy.

Standard Compliance:

All works shall be carried out in accordance with the Building Code of Australia (BCA) and where necessary nominated reference standards.

AS 1720 Timber Framing Code
AS 1684-2006 National Timber Framing Code
AS 2870-1996 Residential Slabs and Footing Construction
AS 3959-2009 Construction of Buildings in Bushfire-Prone Zone Areas
AS 2904-1995 Damp-proof course and flashings
AS 3600-2001 Concrete Structures
AS 1170 Part 1 Loading Code
AS 1170 Part 2 Wind Code
AS 3660.1-2001 Protection of Buildings against subterranean Termite – Part 1 New Buildings
AS 4055-2006 Wind Loading for Housing
AS 3623 and AS/NZ 4600 – Steel Framing
NASH Standard 2005, Part 1 – Steel Framing
Where standards have been revised, the most current version shall apply.

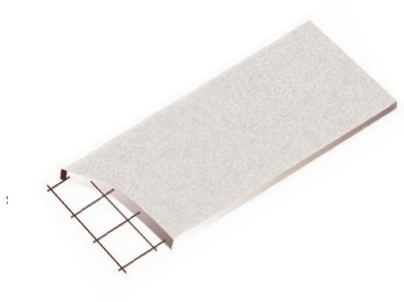
Using the Loxo®Floor System

Your Floor – build it with Loxo®

Solid, masonry and lightweight

High fire resistance

Sound acoustic qualities



The Loxo® 50mm Lightweight AAC Floor Panel System

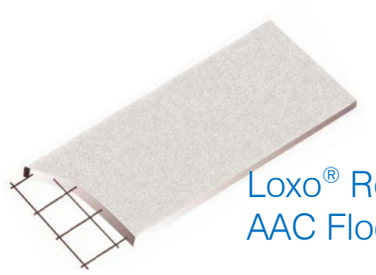
The Loxo Floor Panel System is designed to be used in residential construction over timber or steel framing floor joists systems spaced at 440mm centres. The system consists of 50mm thick Loxo Panels, reinforced with corrosion protected steel in both directions. For fast, clean construction, Loxo panels are available in standard sizes of 2200mm in length and 600mm in width.

Loxo® Material Properties

Property	Value	Units
Ambient[1] Density, ρ_{amb}	520	kg/m^3
Dry[2] Density, ρ_{dry}	500	kg/m^3
Working[3] Density, ρ_{design}	610	kg/m^3
Permanent Action, *G*	0.3	kN/m^2
Characteristic Unconfined Compressive Strength, f'_{uc}	1.1	MPa
Modulus of Rupture, f'_{ut}	0.73	MPa
Design Ultimate Limit State Bending Capacity, *øM*	0.12	kNm
Design Serviceability Limit State Deflection Limit, δ_{max}	$^{SPAN}/_{240}$	
Coefficient of contraction	0.4	mm/m
Coefficient of thermal expansion	10	x10^{-6}/°C

Notes:

1. Ambient density is that achieved by the product when it has reached equilibrium at 23°C, 50% RH. The moisture content by mass in this state is typically between 2% and 5%.
2. Dry density is the manufacturer's reported density, the typical frame of reference for grading AAC material. It is achieved by oven drying specimens so that the moisture content is 0%.
3. Working density is to be used for calculation of effects due to permanent actions.



Loxo® Reinforced AAC Floor Panel

Quality Control

Quality from start to finish

It is highly recommended that Loxo® Floor panels are installed by approved Installers in accordance with the Loxo®Floor Design and Installation Manual. With these measures in place plus strict system protocol Loxo® offers a warrantee of 15 years on materials and 7 years on workmanship adding peace of mind to all owners. Loxo® and associated manufacturers both adhere to the ISO 9001 international standards for management of quality.

The 50mm thick, steel reinforced Loxo® Floor Panels are manufactured from autoclaved aerated concrete with an average density of 560kg/m^3. The Loxo®Floor Panels are supplied in standard sizes of 2200mm in length and 600mm width and have an average weight of approx **37kg**/panel.

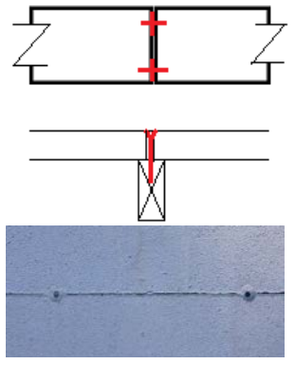
Installation of 50mm Loxo® Floor Panel

- Floor Joists Frame is completed.
- Joist set out at 440mm centres
- Minimum joist width of 45mm required, but joist width of 63mm or greater is preferred
- 90mm joist shown

- Apply construction adhesive to joist
- Position panel over construction adhesive
- Fix panel to joist with 14gx75mm bugle screws
- 2 screws per joist
- Min 50mm from panel edges

- Apply construction adhesive to panel edge and joist.

- Apply construction adhesive to the next lot of joist to accept the next panel length
- Butt panels end to end
- Ensure panels are aligned
- Screw fix as per previous
- Screws at joint to be fixed between both panels
- i.e. share the screws between both panels



Loxo® Floor Panel System

- Apply construction adhesive to all panel edges and joist
- Start next row of panels with a minimum of 440mm staggered joint

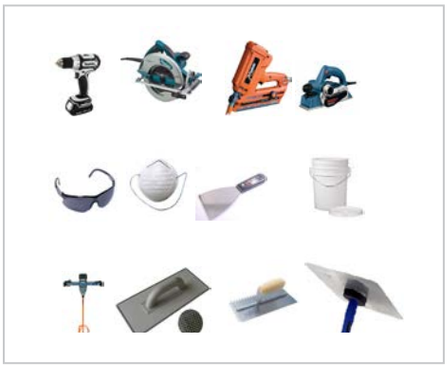
- Continue panel installation in the “stretcher bond”, staggered panel layout.

- Continue panel installation until the floor area is complete.

- Combine Loxo 50mm Floor Panels with Compressed Sheet flooring in wet areas to effortlessly achieve the desired step down for wet areas.

Basic Tools Required

- Power Drills and Drive Bits
- Cordless Drills
- Power Saw with Diamond Blades
- Vacuum
- Mixing Drill
- Mixing Bucket
- Electric Leads and Power Box



Loxo® Floor Panel System

Delivery Storage & Handling

Delivery

Loxo® Panels are flat-packed delivered to site (20 in a pack) and shall be unloaded or moved with approved lifting devices. For transport and lifting purposes the wet mass of the panels should be used. Each pack has a wet mass of approximately 900kg including the packaging. To minimise double handling and save time the packs should be unloaded as close as possible to the installation area. Loxo® panel packs should only be stacked one pack high (on site) and properly supported on level ground. Always consult the project engineer as to the adequacy of the structure to support the packs if they are to be placed on any part of the structure.

Storage

All Loxo® material should be kept dry and preferably under cover, all care should be taken to avoid damage to the face, ends and edges of the panels.
When Loxo® Panels are stored outside they must be off the ground and protected from the weather.

Manual Handling

Physical manual handling of Loxo® Panels around the work site should be kept to a minimum, always support the weight by a two man lift procedure, and where the manual handling becomes excessive with respect to distance from the installation area, Loxo® recommends the use of trolleys and/or other mechanical devices.

Occupational Health & Safety (OH&S):

Loxo® AAC Panels, along with all clay, concrete and quarry products contains Crystalline Silica, or Silica Dust. Prolonged exposure to Silica dust without the correct PPE can be harmful and potentially cause life threatening health hazards such as bronchitis, silicosis and lung cancer.

The Loxo® AAC Panel itself does not cause health problems – however when cutting, drilling, sawing, routing, chasing, sanding and in any way breaking up the material there is the potential for health problems to occur unless standard precautionary measures are taken. Breathing in the dust repeatedly, over many years may lead to health problems.

It is most unlikely to breath in the fine silica dust when stacking, loading or laying panels.
When breaking up the material, sawing, drilling etc it is imperative that safety masks and eye protection is worn. Ensure the mask fits properly and is approved for use with dust. Protective clothing should also be worn e.g. overalls. These should be washed often and not in the same wash as other clothes.

The site should be cleaned of dust every day and when using power tools these should be tagged for use as required and be fitted with efficient and well maintained dust extraction devices.

The Loxo® Cladding Panel Installer on site has a responsibility to inform all employees of these Health and Safety requirements under the Occupational Health and Safety Act.

Personal Protective Equipment (PPE)

When working with Loxo® panels, Loxo® recommends (as a minimum) that the following PPE is worn:

- P1 or P2 Dust masks – complying with AS/NZS1715 and AS/NZS1716
- Glasses / Goggles - complying with AS1336
- Ear Plugs / Ear Muffs – Class 5
- Gloves, long sleeve shirt and long pants – to prevent possible skin irritation and skin cancer from working outdoors.
- Steel Cap Boots

Warranty & Guarantee

Cutting

Loxo® Panels can be easily cut, drilled, routered, or chased using power or hand tools. When working with Loxo® Panels ensure that the PPE as previously described is worn. As an added measure of containing the dust when working with AAC products, Loxo® recommends the use of dust extraction equipment.

Loxo® panels are delivered to site flat packed, which gives flexibility to cutting as it can be used as the cutting bench as the panels are required, (make sure that the saw blade is adjusted to the right cutting depth so as not to cut through the panel below). Any exposed reinforcement during cutting must be coated with Loxo® Corrosion Protection Touch Up Paint. For a copy of the full range of Loxo® MSDS sheets, visit the Loxo® website; www.loxo.com.au

Maintenance

Regular checks and cleaning, at least annually, of the jointing and coating systems must be carried out and any routine maintenance performed as and when required to maintain weather tightness. Any damage to the coating system must be promptly repaired by an approved applicator to ensure the integrity of the coating system is maintained.

Hazardous Materials

In reference to the BCA regarding Hazardous Building Materials, Loxo® Panels are non-hazardous, providing all safety precautions included in this literature are adhered to.

Loxo® is a quality building product, and is backed by Loxo® Cladding Systems Pty Ltd.

For further details on engineering and building with the Loxo® system, sales or technical assistance please visit our website: www.loxo.com.au and obtain the latest Design & Installation Manual.

Guarantee

Loxo® Autoclaved Aerated Concrete products are guaranteed to be free of defect in material and manufacture.

This guarantee excludes all other guarantees and liability for consequential damage or losses in connection with defective cladding, other than those imposed by legislation.

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Warranty

Loxo® Panels and associated materials, when installed as exterior wall cladding, are warranted for a minimum of ***15 years*** (from date of purchase), meeting the ***7 year*** requirements outlined in the BCA and the relevant Australian Standards. The Loxo® products are designed to have a life span significantly in excess of this minimum period.

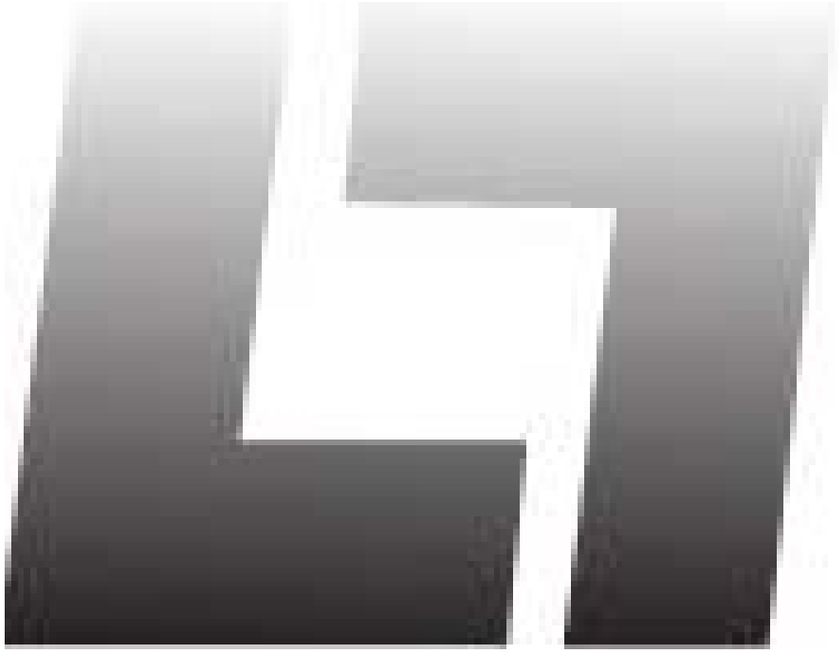
The Loxo® Approved Coating Systems are warranted by the coating system manufacturers for a period of 7 years (from date of completion) meeting the 7 year requirements outlined in the BCA and the relevant Australian Standards. The Loxo® Approved Coating products are designed to have a life span significantly in excess of this minimum period.

Disclaimer:

While every effort is made by Loxo® to ensure that the information in this publication is accurate at the time of publication, Loxo® makes no representation about the contents and suitability of this information for any purpose. You should make your own enquiries to determine whether the Loxo® product is suitable for your needs. As the use and installation of the Loxo® product is outside of our control, Loxo® accepts no responsibility for any loss or damage arising from the improper or incorrect use of the product. Use of the Loxo® product is subject to all pre-existing rights and any requirements of the law in your jurisdiction.

Loxo® reserves the right to revise or amend this manual and its contents from time to time without notification to any persons or individuals of such revisions or amendments.

It is advised to refer to the Loxo® website for the most up to date version or addition thereof.



CERTIFICATE OF CONFORMITY

This is to certify that

LOXO CLADDING SYSTEMS: 50mm AAC Panel

Product description
2200 x 600 x 50 mm Reinforced Autoclaved Aerated Concrete (AAC) Panel
Product purpose or use
1. Fire rated cladding for load-bearing external timber or steel framed walls 2. Fire barrier between timber or steel framing of separate occupancies in residential apartments. (The AAC will also contribute, together with insulating material, to providing acoustic attenuation.) 3. Flooring for timber or steel framed floor structures
Certificate holder
Loxo Cladding Systems Pty Ltd 1331 Stud Road Rowville, VIC 3178

Complies with the National Construction Code 2012:

1. **Volume One BP1.1, BP1.2 and Volume Two P2.1** in respect of structural performance, when designed and constructed in accordance with the Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition, and:
   - Table 1, Table 2 and Table 5
   - Loxo 50mm AAC Party Wall System Design and Installation Manual, August 2012 Edition
   - Loxo 50mm AAC Floor System Design and Installation Manual, August 2012 Edition
2. **Volume One CP1, CP2, and Volume Two P2.3.1,** in respect of fire performance, when designed and constructed in accordance with the fire-rated construction specifications and details in the Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition, the Loxo 50mm AAC Party Wall System Design and Installation Manual, August 2012 Edition achieve the following Fire Resistance Levels (FRL):
   - External wall exposed to fire source outside with 10mm internal plasterboard lining: 120/120/90
   - External wall exposed to fire source outside with 13mm internal fire-grade plasterboard lining: 120/120/120
   - Party wall exposed to fire source either side with 10mm plasterboard lining both sides: 90/90/90
3. **Volume One FP1.4 and Volume Two P2.2.2** in respect of weatherproofing for external walls, when detailed and constructed in accordance with the Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition.
4. **Volume One FP1.5 and Volume Two P2.2.3** in respect of damp-proofing for external walls, if provided with damp-proof courses complying with AS 3700–2011 Clauses 4.7.3, 11.6, and 12.4.16.
5. **Volume One FP5.2 and Volume Two P2.4.6** in respect of acoustic performance of walls separating units, when detailed and constructed in accordance with:
   - Table 3,
   - Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition and,
   - Loxo 50mm AAC Party Wall System Design and Installation Manual, August 2012 Edition
6. **Volume One GP5.1 and Volume Two P2.3.4** and **P3.7.4** in respect of buildings constructed in a designated bushfire prone area, when designed and constructed in accordance with the fire-rated construction specifications and details in the Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition, and the requirements of AS 3959–2009, is acceptable for use in all bushfire attack levels including BAL–FZ.
7. **Volume One JP1 and Volume Two P2.6.1** in respect of energy efficiency of walls when designed and constructed in accordance with:
   - Table 4 and,
   - Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition

   In applications where complying thermal resistances of walls or floors are to be calculated, a thermal resistance of R 0.336 m^2.K/W shall be used for 50mm thick Loxo AAC panels.

WWW.JAS-ANZ.ORG/REGISTER

CodeMark Certification Body			18/9/2012	26/9/2012	18/9/2015	GM_CM30031 Rev A1
Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia - www.Global-Mark.com.au	Herve Michoux Managing Director	Unrestricted Building Certifier, Peter Gardner	Date of issue	Last update	Date of expiry	Certificate Number

CERTIFICATE OF CONFORMITY

This is to certify that

LOXO CLADDING SYSTEMS: 50mm AAC Panel

CODEMARK™

State Additions or Variations

1. Volume One:
   - NSW J(A)P1
   - In NT, Qld and TAS Section J is replaced by BCA 2009 Section J
   - SA FP1.5
   - NT FP5.2
   - NSW and Qld GP5.1
   - Tas GP5.1 (a)
2. Volume Two:
   - In NSW Part 2.6 does not apply. New South Wales BASIX classifications are as tabulated as per the NSW Addition.
   - In NT and TAS Part 2.6 is replaced by BCA 2009 Part 2.6
   - Vic P2.6.1
   - SA P2.2.3, NSW P2.2.3,
   - SA P2.3.1
   - Tas P2.3.4
   - NT P2.4.6 (a)

Subject to the following conditions and limitations:

1. Product selection, and incorporation into the building design, shall be made by a professional Architect or Engineer or other appropriate person who:
   - Has qualifications and experience acceptable to the relevant approval authorities; and
   - Has ready access to:
     - Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition
     - Loxo 50mm AAC Party Wall System Design and Installation Manual, August 2012 Edition
     - Loxo 50mm AAC Floor System Design and Installation Manual, August 2012 Edition
2. Product installation shall be carried out by a competent tradesman under the direction of a Builder, both of whom have ready access to:
   - Loxo 50mm AAC Panel System Design and Installation Manual, August 2012 Edition
   - Loxo 50mm AAC Party Wall System Design and Installation Manual, August 2012 Edition
   - Loxo 50mm AAC Floor System Design and Installation Manual, August 2012 Edition
3. Installer must complete, sign and send to the Certificate Holder a Certificate of Installation when installation is completed.

Limit of the scope of certification

This certification includes the weather-proofing and damp-proofing requirements of the AAC walls and flooring, but does not apply to:

- Control of condensation, which requires additional consideration; nor
- Weatherproofing of windows, doors or other items built into the walls. For these, frames must drain to the outside of the building (not into the cavity), frames must be properly sealed and properly flashed.

Table 1, Properties

Property	Value	Units
Ambient[1] Density, ρ_{amb}	520	kg/m^3
Dry[2] Density, ρ_{dry}	500	kg/m^3
Working[3] Density, ρ_{design}	610	kg/m^3
Permanent Action, G	0.3	kN/m^2
Characteristic Unconfined Compressive Strength, f'_{uc}	1.1	MPa
Modulus of Rupture, f'_{ut}	0.73	MPa
Design Ultimate Limit State Bending Capacity, $øM$	0.12	kNm
Design Serviceability Limit State Deflection Limit, δ_{max}	$^{SPAN}/_{240}$	
Coefficient of contraction	0.4	mm/m
Coefficient of thermal expansion	10	$x10^{-6}/°C$

CERTIFICATE OF CONFORMITY

This is to certify that

LOXO CLADDING SYSTEMS: 50mm AAC Panel

CODEMARK™

Notes:

1. Ambient density is that achieved by the product when it has reached equilibrium at 23°C, 50% RH. The moisture content by mass in this state is typically between 2% and 5%.
2. Dry density is the manufacturer's reported density, the typical frame of reference for grading AAC material. It is achieved by oven drying specimens so that the moisture content is 0%.
3. Working density is to be used for calculation of effects due to permanent actions.

Table 2, Fixing Specification

Wind Class	Max Horizontal Spacing for Battens and Panel Screws		Max. Panel Screw Spacing Vertically	
	Corner Zone	Typical Zone	Corner Zone	Typical Zone
N1, N2, N3, C1	600	900	500 (2 screws/600mm)	500 (2 screws/600mm)
N4, C2	600	600	250 (3 screws/600mm)	500 (2 screws/600mm)
N5, C3	450	450	250 (3 screws/600mm)	250 (3 screws/600mm)

Screw size should be No. 14 as specified.

Table 3, Acoustic Insulation

Loxo System	System Details	Acoustic Rating	
		R_w	R_w+C_{tr}
70mm timber frame	• 1 layer of 10mm plasterboard both sides	63	53
90mm timber frame	• 1 layer of R2.0 insulation against the plasterboard	65	55
76mm steel frame	on both sides	64	53
92mm steel frame	• Minimum 10mm cavity both sides of Loxo panel	65	55

Table 4, Thermal Insulation

Loxo System	System Details Based on: 10mm plasterboard lining	Total R-Value (m^2.K/W)	
		Summer	Winter
5070-02 NS and 5090-02 NS	20-40mm cavity, no sarking, 70mm or 90mm frame, R2.0 glasswool insulation	2.63 (min.)	2.84 (min.)
5090-03 NS	20-40mm cavity, no sarking , 90mm frame, R2.5 glasswool insulation	3.11 (min.)	3.24 (min.)
5090-01 DS	40mm cavity, double-sided anti-glare foil sarking, 90mm frame, R2.5 glasswool insulation	3.49	3.83

The above figures refer to a system R-Value (i.e. including air films, cavity and other components)

Table 5, Panel Bending Capacity

Panel Span (mm)	Ultimate Limit State Load (kPa)
450	6.65
600	3.76
900	1.67
1200	0.94
1500	0.60
1800	0.42
2100	0.32

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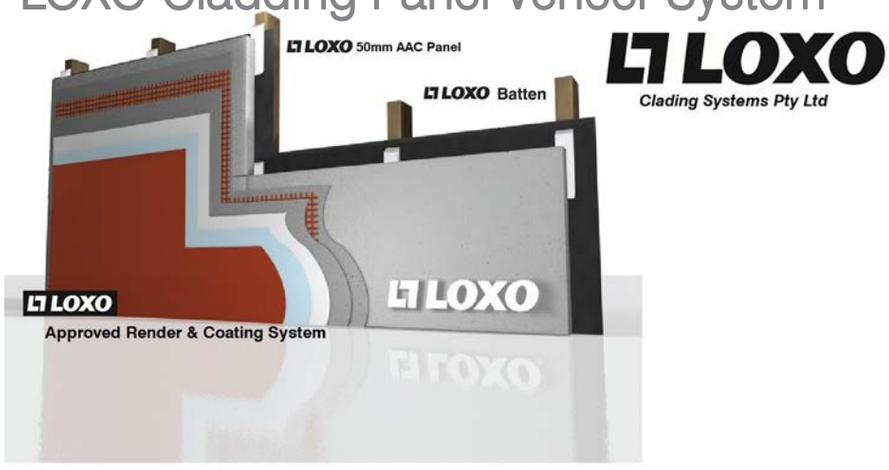
BEAL Appraisal Certificate

LOXO Cladding Panel Veneer System



Product

1.1 The LOXO Cladding Panel Veneer System is a drainable non-ventilated cavity system, comprising Autoclaved Aerated Concrete (AAC) wall cladding panels with a meshed base render, texture coated finish. It is designed to be used as an external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

1.2 The system consists of Autoclaved Aerated Concrete (AAC) panels (LOXO Cladding Panels) fixed over a batten system that has been fixed to a timber or metal wall frame. There is a choice of two batten types; (i) high density polystyrene, and (ii) H3 treated pine timber. The battens can form a cavity from 20mm to 40mm, depending on the requirements of the project.

1.3 A LOXO approved coating system must comply with the following:

1.3.1 A minimum of a 3mm thick Base Coat render reinforced with fibreglass mesh;

1.3.2 A Primer/Sealer.(Optional - dependent on coating manufacturers recommendations);

1.3.3 A minimum of a 1.0mm thick Texture Coat (Wet Texture or Dry Texture material);

The Wet Textures may be coloured through (tinted) and may not require the application of a paint system (dependent on coating manufacturers recommendations)

The Dry Textures will require the application of a 100% acrylic based exterior paint system.

1.4 The system incorporates a primary and secondary means of weather resistance. The primary being the aesthetic coating system applied over the LOXO AAC Panels, but in the event that water was to find its way through the coated wall cladding layer, the cavity acts as the secondary means of weather resistance. The non-ventilated cavity system allows the water to drain to the base of the wall and exit via the (non sealed) perimeter flashing (DPC) which acts as a continual drain (weep hole) at the base of the wall, regardless if the wall is resting on or overhanging the slab or floor system.

Building Regulations

2.1 In the opinion of BEAL, the LOXO Cladding Panel Veneer System, if designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet or contribute to meeting the following provisions of the Building Code of Australia:

BCA 2011 Volume 2 Class 1 and class 10 buildings (Houses, sheds, carports etc.)

Part 2.1 - Structure: Performance requirement P2.1 (see Paragraphs 9.1 to 9.6)

Part 2.2 - Damp and Weatherproofing: Performance requirement P2.2.2 Weatherproofing (see Paragraphs 12.1 to 12.7)

Part 2.3 - Fire Safety: Performance requirement P2.3.1 (see Paragraph 11.1)

Applicant:

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Part 2.6 – Energy Efficiency: Performance requirement P2.6.1 Building (see Paragraph 13.1 to 13.3)

2.2 The LOXO Cladding Panel Veneer System has been appraised as an **Alternative Solution** in terms of compliance with the Building Code of Australia.

Scope and Limitations

3.1 The LOXO Cladding Panel Veneer System has been appraised for use as an external wall cladding system for buildings within the following scope:
On class 1 and class 10 type buildings; and,
Constructed with timber framing complying with AS1684 Parts 2 and 4; or,
Constructed with steel framing complying with AS/NZS4600 and NASH Standard 2005 Part 1; and,
situated in non cyclonic wind zones up to, and including N3.

3.2 The LOXO Cladding Panel Veneer System must only be installed on vertical surfaces (except for tops of parapets, sills and balustrades, which must have a minimum 5° slope and be weatherproofed in accordance with the Technical Literature).

3.3 The system is appraised for use with aluminum window and door joinery that is installed with vertical jambs and horizontal heads and sills. (The Appraisal of the LOXO Cladding Panel Veneer System relies on joinery meeting the requirements of AS2047 for the relevant building wind zone or being specifically designed for use in specifically designed buildings).

3.4 Installation of components and accessories supplied by LOXO must be carried out only by personnel trained and certified by LOXO.

Technical Literature

4.1 Refer to the LOXO Cladding Panel Veneer System Technical Manual Edition Dec 2011. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and scope of this Appraisal Certificate must be followed .

4.2 For a copy of this Technical Literature and any subsequent updates please refer to:
www.loxo.com.au

Technical Specification

System Components and Accessories:

5.1 LOXO Cavity Battens:
Cavity battens are 20mm to 40mm thick and 250mm long, manufactured from either:
(i) Very High Density (Class VH) EPS with a density of no less than 28kg/m³ or
(ii) H3 treated pine timber

5.2 LOXO Cavity Batten Fixing:
(i) 50mm hot dipped galvanised steel flat head nail for use with the 20mm battens to timber frames;
(ii) 75mm hot dipped galvanised steel flat head nail for use with the 40mm battens to timber frames;
(iii) 40mm galvanized drill point countersunk screws for use with the 20mm battens to steel frames
(iv) 60mm galvanized drill point countersunk screws for use with the 40mm battens to steel frames;
(v) Construction Adhesive such as Maxbond, Liquid Nails or similar may be used to temporarily fix the battens to the frame or building wrap;

5.3 Vermin Control Strips, or Cavity Closer Strips: Metal:
Metal Vermin Control Strips or Cavity Closer Strips are continuous metal top hats used to close the gap between the bottom plate and the back of the panel. Mitre cut top hats at corners to maintain vermin proofing. The top hats are fixed to the bottom plate using:
- 12-11 x 25mm Hex Head Type 17 screws for timber frames
- 10-16 x 16mm Hex Head Tek screws for steel frames

5.4 Vermin Control Strips, or Cavity Closer Strips: Timber:
Timber Vermin Control Strips, or Cavity Closer Strips are continuous timber LOXO Cavity Battens used to close the gap between the bottom plate and the back of the panel. Mitre cut or butt timber battens at corners to maintain vermin proofing, the timber strips are installed to the bottom plate with 75mm hot dipped galvanised steel flat head nail.

5.5 LOXO Cladding Panels:
LOXO Cladding Panels are manufactured from autoclaved aerated concrete with an approximate density of 560kg/m³. LOXO Cladding Panels are supplied in lengths of 2200mm long by 600mm wide, and are available in the following thicknesses:
- 50mm and weigh approx 37kg per panel
- 75mm and weigh approx 56kg per panel

5.6 LOXO Cladding Panel Fasteners:
- 14-10 x 75mm MP Bugle Head Type 17 screw is used to fix panels to timber battens.
- 14-10 x 100mm MP Bugle Head Type 17 screw must be used with EPS battens up to a maximum cavity thickness of 20mm to ensure a minimum of 25mm of the screw is embedded into the timber frame. These screws are also used in steel frames with EPS battens up to a maximum cavity thickness of 40mm.
- 14-10 x 125mm MP Bugle Head Type 17 screw must be used with EPS battens up to a maximum cavity thickness of 40mm to ensure a minimum of 25mm of the screw is embedded into the timber frame.

NOTE: A minimum of Class 3 fasteners must be used with the LOXO Cladding Panel Veneer System. AS3566 corrosion class 3 or 4 fasteners must be used in BCA defined corrosion zones 1,2,3, and 4. Grade 304 stainless steel in the sea spray zone.

5.7 LOXO Panel Adhesive:
LOXO Panel Adhesive is a polymer modified cement based material supplied in 20kg bags. The adhesive is used for bonding the panel joints during construction and must be applied to both vertical and horizontal panel joints. .

5.8 LOXO Anti-Corrosion Protective Paint:

LOXO Anti-Corrosion Protection Paint is used to treat any exposed reinforcing steel to prevent corrosion occurring. It is supplied in 500ml containers. The instructions for use are on the container.

5.9 Aluminium External Corner Angles:

Aluminium External Corner Angles - 32mm x 32mm are used on all AAC corner edges to provide clean straight edges that are strong and durable.

5.10 LOXO PVC Vents:

LOXO PVC Vents are not required with a non-ventilated system, however if specified by the project engineer, they can be used to create visible drain vents and therefore create a ventilated cavity wall system. If the LOXO PVC Vents are to be used, it is advisable that sarking is used as good building practice.

5.11 Damp Proof Course (DPC):

DPC is used to prevent rising damp from concrete footings, slabs or paths wetting the base of the panels.

5.12 Sarking:

Sarking is required with EPS battens to prevent trapped moisture between the batten and the frame.

5.13 Construction Adhesive:

Construction Adhesive such as Maxbond, Liquid Nails or similar used for adhering accessories such as Aluminium External Corner angles to LOXO Cladding Panels, or temporarily fixing EPS Cavity Battens prior to the installation of the Panel Fasteners.

5.14 Flexible-sealant:

An external grade flexible sealant such as Bostik Seal 'N' Flex or equivalent can be used as a weather proofing sealant around windows, doors and penetrations through the LOXO Cladding Panels, to prevent or reduce the amount of water ingress into the cavity as good building practice.

LOXO Approved Render (Coating System)

All Render and Paint components used for the coating of the LOXO Cladding Panels are to be approved by LOXO and must conform to the following criteria:

6.1 Base Coat Render:

The base coat render must be fully meshed. It must be a polymer-modified, Portland cement-based render; it is mixed on site with clean drinking water. It is applied as a base coat, either over or encapsulating a high quality alkali resistant fibre glass mesh reinforcement. Ensure there is a minimum of 2mm thickness over the mesh. The total meshed base coat should have a minimum thickness of 3mm.

6.2 The Reinforcing Mesh:

The Reinforcing Mesh must be a high quality alkali resistant fiberglass mesh with a nominal size of approx. 4mm – 5mm square and a weight of 150g/m² for use in domestic and light commercial situations.

6.3 Primer Coat (Optional):

A water based primer/sealer to enhance adhesion. (Refer to coating manufacturer's specification)

6.4 Texture Coat:

Two specifications for the Texture Coat material are available:

6.4.1 Dry Texture: **(Cement based polymer modified dry powder)**

A high build cement based polymer modified coating applied with a trowel or float over the basecoat. The texture must have a minimum thickness of 1.0mm. ***It is mandatory*** to overcoat the dry texture with a LOXO approved paint system.

6.4.2 Wet Texture: **(A pre-mixed full acrylic texture)**

A high build full acrylic coating applied with a trowel or float over the basecoat. The texture must have a minimum thickness of 1.0mm. The Wet Textures may be coloured through (tinted) and may not require the application of a paint system (dependent on coating manufacturers recommendations).In the case were a paint system is not required, the application of the wet texture forms the primary means of weather resistance.

6.5 Paint System:

The paint system (membrane coating) must comprise a minimum of two coats of a 100% acrylic-based exterior paint. The paint / membrane must be applied to a minimum dry film thickness of 150*um* per coat and must have a crack bridging capability of five (5) times the total dry film thickness. The application of the paint system forms the primary means of weather resistance.

Handling and Storage

7.1 Handling and storage of all the materials supplied by LOXO or the accredited contractor, both on and off site are under the control of LOXO accredited contractors.

7.2 Dry storage must be provided on site for the LOXO Cladding Panel, fiberglass mesh and bags of adhesive/render with the LOXO Cladding Panels stored flat and protected from physical damage. EPS and timber battens, flashing, mouldings etc. must be protected from direct sunlight, physical damage and stored flat and under cover out of the weather. All liquid components shall be stored in dry, frost free conditions.

7.3 Handling of LOXO Cladding Panels require care to prevent damage to corners or excessive flexing. Panels should always be carried on edge.

7.4 Handling and storage of all the materials supplied by the building contractor, both on and off site is the responsibility of the building contractor. Materials must be handled and stored in accordance with the manufacturer's instructions.

Design Information

Framing

Timber Framing

8.1 Timber used in timber framing shall be treated as required by the relevant Part of AS1684.

8.2 Timber framing must comply with the relevant Part of AS1684 for both buildings or parts of buildings. Where buildings or parts of buildings are outside the scope of AS1684 then they must be to specific design in accordance with AS 1720. In all cases, studs must be at a maximum of 600mm centres.

8.3 Where the ground or sub-floor space is excessively damp or subject to frequent flooding, timber members shall be Class 1 or 2 or H3 preservative treated timber in accordance with AS1684 parts 2 or 4

Steel Framing

8.4 Steel framing must comply with NASH Standard 2005, Part 1 Residential and low-rise steel framing. In all cases, studs must be at a maximum of 600mm centres. Noggins must be fitted flush with the stud.

LOXO Cladding Panel Layout

8.5 LOXO Cladding Panels are installed horizontally in a stretcher-bond pattern. Vertical panel edges may be jointed on stud or off stud via back blocking. LOXO Cladding Panels must be supported at fixing locations with vertical cavity battens in accordance with the requirements of BCA. At the base of the wall the LOXO Cladding Panel can be either rested on a concrete rebate (a minimum of 30mm below the finished floor level) or hang 50mm below the finished floor level, but not below the external ground level.

General

8.6 The LOXO Vents provide a minimum ventilation opening area of 1000mm² per lineal metre of wall, when fixed at 1000mm centres. If specified, then the specifier must detail the number of vents required to achieve the desired ventilation flow.

8.7 The ground clearance between the bottom of the finished panel and ground must be adhered to at all times. At ground level, paved surfaces must be kept clear from the bottom edge of the LOXO Cladding Panel Veneer System by a minimum of 10mm, and unpaved surfaces by 25mm with these areas having a minimum of 1 in 100mm fall away from the building.

8.8 At balcony, deck or roof to wall junctions, the bottom edge of the panel must be kept clear of any adjacent finished surface, or above the top surface of any adjacent roof flashing by a minimum of 10mm.

8.9 Where the LOXO Cladding Panel Veneer System abuts other cladding systems, designers must detail the junction to meet their own requirements whilst meeting the performance requirements of the BCA. The Technical Literature does provide some guidance. Details not included in the Technical Literature have not been assessed and are therefore outside the scope of this Appraisal.

8.10 For buildings that must have barriers to airflow, the use of plasterboard interior linings with all joints stopped should be installed, or where walls that are not lined, such as attic spaces at gable end, a rigid sheathing or air barrier, complying with BCA, must be fixed to framing prior to fixing cladding or cavity battens as per BCA or AS 1684.

8.11 PVC sheathed electrical cables must be prevented from direct contact with the LOXO EPS Cavity Battens. When cables must penetrate the EPS cavity battens for electrical connections, the cable must be encased within electrical conduit so that contact is prevented.

Articulated Joints (Control Joints)

8.12 Control joints where LOXO Cladding Panels are used must be constructed in accordance with the Technical Literature and as follows;

8.13 Horizontal control joints - To be installed when intermediate floor joists are not seasoned and/or when the height of the wall exceeds 8.0m

8.14 Vertical Control Joints – are required at internal corners and at maximum of 6.0m centres; aligned with any control joint within the structural framing, or where the system abuts other cladding system.

(Note: Where possible control joints shall be located in line with window and door openings. Horizontal and vertical control joints must be located over structural supports. The Technical Literature provides some guidance for the design of vertical control joints where the system abuts different cladding types. Details not included within the Technical literature or those that are marked as 'Specific Design Only' are outside the scope of this Appraisal Certificate and are the responsibility of the designer.)

Inter-Storey Junction

8.15 Inter-storey drained joints are not required with the LOXO Cladding System.

Structure - Clause P2.1

Mass

9.1 The dry mass of the LOXO Cladding Panel is approximately 28kg/m^2 without coating and 30kg/m^2 to 32kg/m^2 with the applied coating .

Impact Resistance

9.2 The system has adequate resistance to impact loads that the cladding system is likely to be subjected to when used in a residential situation.

Wind Zone

9.3 The LOXO Cladding Panel Veneer System is suitable for use in all building wind zones as per AS 4055, up to, and including N3, or up to the ultimate limit state (ULS) wind pressure of 2500Pa when the building is subject to specific design.

9.3.1 Where a 20mm to 40mm cavity is produced the respective cavity battens are fixed to the wall framing at 600mm centres vertically. The LOXO Cladding Panel must then be fixed into or through the cavity batten with the appropriate screw at 500mm centres.

500mm centres is applicable to both;

9.3.2 *N1 to N3 defined building wind zones with studs at maximum 600mm centres, and;*

9.3.3 *Specifically designed buildings up to design differential 2.5kPa ULS wind pressure with studs at maximum 600mm centres.*

Generally:

9.4 *Fixings to be positioned minimum 50mm in from the edge of the panel giving an overall layout of 500mm*

centres per panel.

9.5 *Fixings are also required horizontally at 600mm centres and to a maximum of 900mm centres.*

9.6 *Bugle head screws must be embedded a minimum of 5mm into the* LOXO Cladding Panel *and a maximum of 10mm.*

Durability (suitability) Clause 1.2.1

10.1 The LOXO Cladding Panel Veneer System when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use will meet the requirements of S1.2.1 of the BCA.

Maintenance:

10.2 Regular maintenance is essential to ensure the performance requirements of the BCA / NZBC are met and to ensure the maximum serviceability of the LOXO Cladding Panel Veneer System.

10.3 Regular cleaning (at least annually) of the paint coating is required to remove grime, dirt and organic growth as per the coating manufacturer's Technical Literature in order to maximize the life and appearance of the acrylic paint coating. Paint coatings must be reapplied every 10 years or in accordance with the paint manufacturers instructions. .

10.4 Regular inspections (annually) must be made on the system to ensure that all aspects of the LOXO Cladding Panel Veneer System including the coating system, renders, flashings and any sealed joints remain in a weatherproof condition. Any cracks, damaged areas or areas showing signs of deterioration that could allow water ingress, must be repaired immediately. The LOXO Cladding Panel Veneer System must be maintained and repaired in accordance with the instructions from LOXO.

10.5 Minimum ground clearance and adjacent clearances as set out in this Appraisal and Technical Literature must be maintained at all times during the life of the system to maintain the durability and weatherproofing of the system.

External Fire spread - Clause P2.3.1

11.1 The LOXO Cladding Panel Veneer System meets the performance requirements of the BCA for use as a Load Bearing External Wall. The LOXO Cladding Panel Veneer System provides an FRL of 90/90/90.Tested in accordance with AS 1530.4.

External Moisture - Clause P2.2.2

12.1 When installed in accordance with this Appraisal Certificate and Technical Literature, the LOXO Cladding Panel Veneer System will prevent the penetration of water that could cause undue dampness and/or damage to building elements and will therefore comply with Performance requirement P2.2.2 of the BCA.

12.2 The cavity must be sealed off from the roof and subfloor space.

12.3 The LOXO Cladding Panel Veneer System allows excess moisture present within the cavity at the completion of construction to be dissipated without causing permanent damage to the building elements to meet the performance requirement of the BCA.

12.4 The details provided within the Technical Literature for weatherproofing are based on the design principle of employing both a 1st and 2nd line of defence against moisture entry for joints, penetrations and junctions. Moisture ingress must be prevented by detailing any joinery or wall junctions as shown in the LOXO Cladding Panel Veneer System technical manual. Any weatherproofing details developed by a designer that are outside the scope of this Appraisal Certificate that are the responsibility of the designer .

12.5 The presence of a drained cavity does not reduce the requirement to ensure the cladding wall and all the relevant junctions, penetrations etc remain weather resistant.

Water Vapour

12.6 The LOXO Cladding Panel Veneer System is not a barrier to the passage of water vapour, and when correctly installed in accordance with both this Appraisal and Technical Literature will not create or increase the risk of moisture damage resulting from condensation. When installed over steel frame please refer to 12.7.

12.7 When the LOXO Cladding Panel Veneer System is installed over steel framing, 10mm (V.H) expanded polystyrene thermal break sheeting with a R value of at least 0.3, must be installed over the steel frame (stud, nog, top and bottom plate) to provide a thermal break in accordance with the requirements of the BCA. Building wrap is then dressed over the top of the sheeting followed by the installation of the cavity battens.

Thermal Performance - Clause P2.6.1

13.1 The LOXO Cladding Panel has a thermal rating from the manufacturer for the 50mm thick AAC panel of R0.39.

13.2 A table has been developed from the use of 70mm and 90mm wide timber framing studs at 600mm centres, with noggins at 1350mm centres, using Enviroseal Wall Wrap reflective foil wall wrap (sarking) with a R1.2 (summer) and R1.3 (winter), and insulation with a nominal R-Value of 2.0;

Refer to Thermal Performance Values shown on page 8.

Acoustic Performance

14.1 The LOXO Cladding Panel has an acoustic STC rating of 33 from the manufacturer for the 50mm thick AAC panel. A table has been developed from the use of 90mm wide timber framing studs at 600mm centres, with noggins at 1350mm centres, insulation with a nominal R-Value of 2.0 and a nominal 10mm plasterboard;

Refer to Acoustic Performance Values shown on page 9.

Installation Information

Installation Skill Level Requirement

15.1 Installation and finishing of the components and accessories supplied by LOXO and the

accredited contractors must be completed by trained installers/applicators, certified by LOXO.

15.2 Installation of the accessories supplied by the building contractor must be completed by a tradesperson who has an understanding of cavity based cladding construction, in accordance with instructions given within the LOXO Cladding Panel Veneer System Technical Manual and this Appraisal Certificate.

System Installation

16.1 The building wrap (if required) must be installed by the building contractor in accordance with the wrap manufacturer's instruction, prior to the installation of the cavity battens and the rest of the LOXO Cladding Panel Veneer System. The building wrap shall be run horizontally and be continuous around corners. The wrap must be lapped not less than 75mm at horizontal joints and not less than 150mm over studs at vertical Joints.

16.2 Window and Door joinery must be installed by the building contractor in accordance with the LOXO Technical Literature.

16.3 The Window and Door joinery must be spaced outside of the wall frame to suit the thickness of the cavity batten system.

LOXO Cladding Panel Veneer System

16.4 Must be installed in accordance with the Technical Literature by LOXO accredited contractors.

16.5 The Technical Literature must be referred to during the inspection of the LOXO Cladding Panel Veneer System installations.

Finishing System

16.6 The application of the LOXO approved coating system must be applied in accordance with the manufacturers
instructions at all times.

Health and Safety

17.1 When cutting, drilling or grinding the LOXO Cladding Panel, this must be carried out in an open air or well ventilated area, and a dust mask, eye protection and gloves must be worn.

17.2 All aspects of cutting, drilling or grinding must comply with the latest regulations of Worksafe Australia (Occupational Health and Safety).

17.3 Refer to the Technical Literature from the relevant manufacturer for the safe use and handling of the components that make up the LOXO Cladding Panel Veneer System.

Basis of Appraisal

BEAL use the compliance verification procedure to demonstrate compliance with the relevant clauses of the BCA based on a risk analysis procedure. The following is a summary of the technical investigations carried out

Tests

18.1 The following testing of the LOXO Cladding Panel Veneer System and its respective components has been undertaken by BEAL unless otherwise noted:

18.1.1 BEAL opinion on BCA compliance was based on the evaluation of all details within the scope of this Appraisal and testing of LOXO Cladding Panel Veneer System to a weathertightness test method known as E2/VM1. The testing assessed the performance of the window head, jamb and sill details, meterbox head, jamb and sill details, vertical control joints, internal and external corners.

18.1.2 BEAL have also reviewed the details contained within the technical manual, and an opinion has been given by BEAL that the system will meet the performance requirements for a drained and non-ventilated cavity system.

18.1.3 Testing undertaken by OPUS laboratories in determining the compressive strength, dry bulk density and drying shrinkage of the LOXO Cladding Panel to verify durability of the system.

18.1.4 Corrosion protection of the steel wire reinforcement in the LOXO Cladding Panel was tested to verify durability and conducted by AZUMA design in Australia to AS2331.3.11 and ASTM B117.

Other Investigations

19.1 Wind loadings, self weight, seismic loadings, shear force, panel capacity, fastener pull through testing and calculations for the LOXO Cladding Panel Veneer System were determined by an independent Chartered Engineer in respect to the requirements of Structure. Structural and durability opinions were provided.

19.2 Assessment of Fire resistance of the 50mm thick LOXO Cladding Panel was based on a comparison of test data from other manufacturers testing for spread of fire and fire resistance based on AS1530.4.

19.3 Thermal Performance testing and calculations for the LOXO Cladding Panel Veneer System were determined by an independent Chartered Professional Engineer in respect to the requirements of Performance Requirement P2.6.1

19.4 Assessment of Acoustic Performance for the LOXO Cladding Panel Veneer System was based on a comparison of test data from other manufacturers testing for Acoustic performance.

19.5 Ease of application has been assessed

19.6 The Technical Literature for the LOXO Cladding Panel Veneer System has been examined by BEAL and found to be satisfactory.

Quality

20.1 The quality of materials, components and accessories supplied by LOXO is managed through the use of the Building Product Quality Plan.

20.2 The LOXO Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to supply of components.

20.3 LOXO Building Product Quality Plan is reviewed at least annually by BEAL.

20.4 Quality on site is the responsibility of the LOXO accredited contractors.

20.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems, and general construction detailing in accordance with the instructions of LOXO and this Appraisal Certificate.

20.6 For a copy of this Technical Literature and any subsequent updates please refer to: www.loxo.com.au

20.7 Building owners are responsible for the maintenance of the LOXO Panel Veneer Cladding System in accordance with instructions of LOXO and this Appraisal Certificate.

Sources of Information

- AS 2331.3.1 Methods of test for metallic and related coatings -Corrosion and related property test
- AS 3566 Self drilling screws for the building and construction industries.
- AS 3730 Guide to the properties of paints for buildings
- AS/NZS 1170:2002 Structural design actions
- ASTM B117 Standard practice for operating salt spray apparatus
- ASTM C 297: Standard test method for flatwise tensile strength of sandwich constructions.
- ASTM C 1386: Standard specification for precast autoclaved aerated concrete (AAC)
- NASH 3405:2006 Steel framed buildings
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber structures standard
- NZS 3604:1999 Timber framed Buildings
- NZS 4211:1985 Specification for performance of windows
- The Building Code of Australia 2011 Class 1 and Class 10 Buildings,
- NZS 4211:1985 Specification for performance of windows
- AS4859.1:2002 and Amendment 1:2006
- New Zealand Building Code Handbook and Approved Documents, Building industry Authority, 1992.

Concluding statement

21.1 In the opinion of BEAL, the LOXO Panel Veneer Cladding System is fit for purpose and will comply with the BCA to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate.

The Appraisal Certificate is issued only to LOXO Cladding Systems (Pty) Ltd and is valid until further notification, subject to the conditions of this Appraisal.

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Conditions of Appraisal

1. This Appraisal Certificate :
   A) Relates only to the LOXO Panel Veneer Cladding System as described herein;
   B) Must be read, considered and used in full together with the Technical Literature
   C) Does not address any legislation, regulations, codes or standards, not specifically named herein;
   D) Is copyright of BEAL

2. The Appraisal Certificate holder continues to meet the quality requirements of the LOXO Building Product Quality Plan and has the Appraisal Certificate revalidated by BEAL on an annual basis.

3. LOXO Cladding Systems (Pty) Ltd shall notify BEAL and obtain approval of any changes in product specification or quality assurance prior to product being marketed including any trade literature, web site info or the like.

4. BEAL makes no representation as to:
   A) The nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   B) The presence or absence of any patent or similar rights subsisting in the product or any other product;
   C) Any guarantee or warranty offered by the Appraisal Certificate holder

5. BEAL's verification of the building product or system complying with one or more above-mentioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the BCA at the date of this Appraisal Certificate. In the event that the criteria is withdrawn or amended at a later date, this Appraisal may no longer remain valid.

6. Any reference in this Appraisal Certificate to any other publication shall be read as a reference to the version of publication specified in this Appraisal Certificate.

Authorised Signatory

C R Prouse - Principal Building Scientist

Thermal Performance Values

THERMAL TABLES FOR 50mm LOXO WALL SYSTEMS

Confirmed by Fricker Report

LOXO System	System Details – 70mm Frames (The following Systems are all based on 50mm LOXO Panel, 70mm Frame Thickness, and 10mm Plasterboard internal linings)	Total R Value m2K/W	
		Winter	Summer
5070-01	Panel + 20mm Cavity + No Sarking + Frame + No Insulation + Plasterboard	0.80	0.78
5070-02	Panel + 20mm Cavity + Sarking + Frame + No Insulation + Plasterboard	1.52	1.39
5070-03	Panel + 20mm Cavity + Sarking + Frame + R2.0 Insulation + Plasterboard	2.90	2.69
5070-04	Panel + 20mm Cavity + No Sarking + Frame+R2.0 Insulation+ Plasterboard	2.90	2.69
5070-05	Panel + 40mm Cavity + No Sarking + Frame + No Insulation + Plasterboard	0.80	0.78

Note: Sarking used in tables is Single Sided Reflective Foil Type

LOXO System	System Details – 90mm Frames (The following Systems are all based on 50mm LOXO Panel, 90mm Frame Thickness, and 10mm Plasterboard internal linings)	Total R Value m2K/W	
		Winter	Summer
5090-01	Panel + 20mm Cavity + No Sarking + Frame + No Insulation + Plasterboard	0.80	0.78
5090-02	Panel + 20mm Cavity + Sarking + Frame + No Insulation + Plasterboard	1.56	1.40
5090-03	Panel + 20mm Cavity + Sarking + Frame + R2.0 Insulation + Plasterboard	2.90	2.69
5090-04	Panel + 20mm Cavity + No Sarking + Frame+R2.0 Insulation+ Plasterboard	2.90	2.69
5090-05	Panel + 40mm Cavity + No Sarking + Frame + No Insulation + Plasterboard	0.80	0.78
5090-07	Panel + 40mm Cavity + Sarking + Frame + R2.0 Insulation + Plasterboard	2.91	2.70

Note: Sarking used in tables is Single Sided Reflective Foil Type

Acoustic Performance Values

EXTERNAL WALL SYSTEM

LOXO System	System Details – 90mm Frames (The following Systems are all based on 50mm LOXO Panel, 90mm Frame Thickness, and 10mm Plasterboard internal linings)	Acoustic Rating	
		Rw	Rw + Ctr
5090-01A	Panel + 40mm Cavity + No Sarking + Frame + R2.0 Insulation + Plasterboard	47	41
5090-02A	Panel + 40mm Cavity + Sarking + Frame + R2.0 Insulation + Plasterboard	47	41
5090-03A	Panel + 40mm Cavity + Frame+R1.6 SoundScreen + Soundchek Plasterboard	60	50

PARTY WALL SYSTEM

LOXO System	System Details – 90mm Frames The following PartyWall System is based on Discontinuous Construction using 50mm LOXO Panel and Standard 10mm Plasterboard	Acoustic Rating	
		Rw	Rw + Ctr
50PWS01	PlasterBoard + Frame + R2.0 Insulation + 10mm gap + Panel + 10mm gap + R2.0 Insulation + Frame + PlasterBoard	63	51

GLOBAL ENVIRONMENTAL STANDARD LICENCE

ISO 14024 – Third Party Environmental Labeling Program

LICENCE NO: LOX-2011
ISSUED TO:

Loxo Cladding Systems Pty Ltd

PRODUCT(S) NAME:

Loxo Panels

STANDARD:

GES / CE / 2011

ADDRESS:

1331 Stud Road
Rowville VIC 3178

Re-certification Date:

27th November 2016

Petar Johnson
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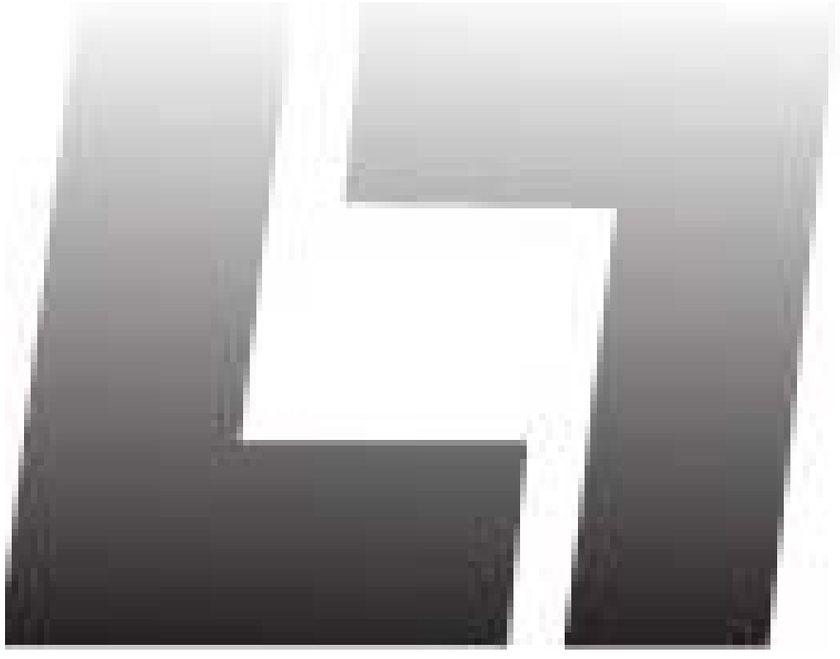
Weston ACT 2611 Australia



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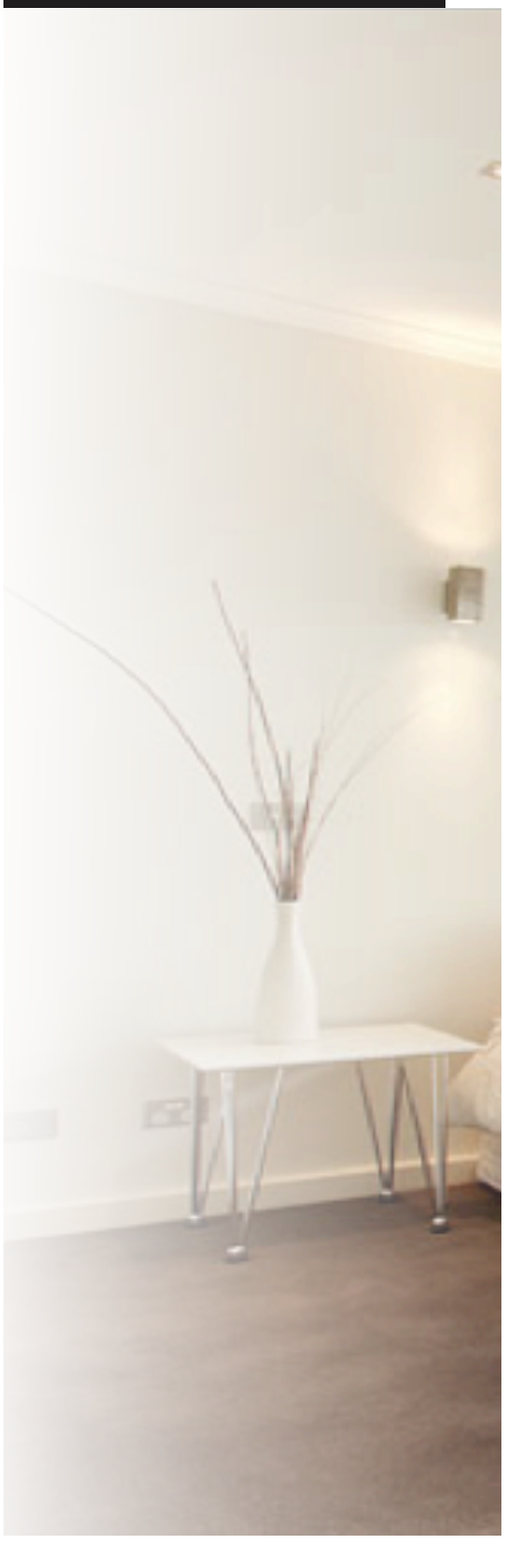

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